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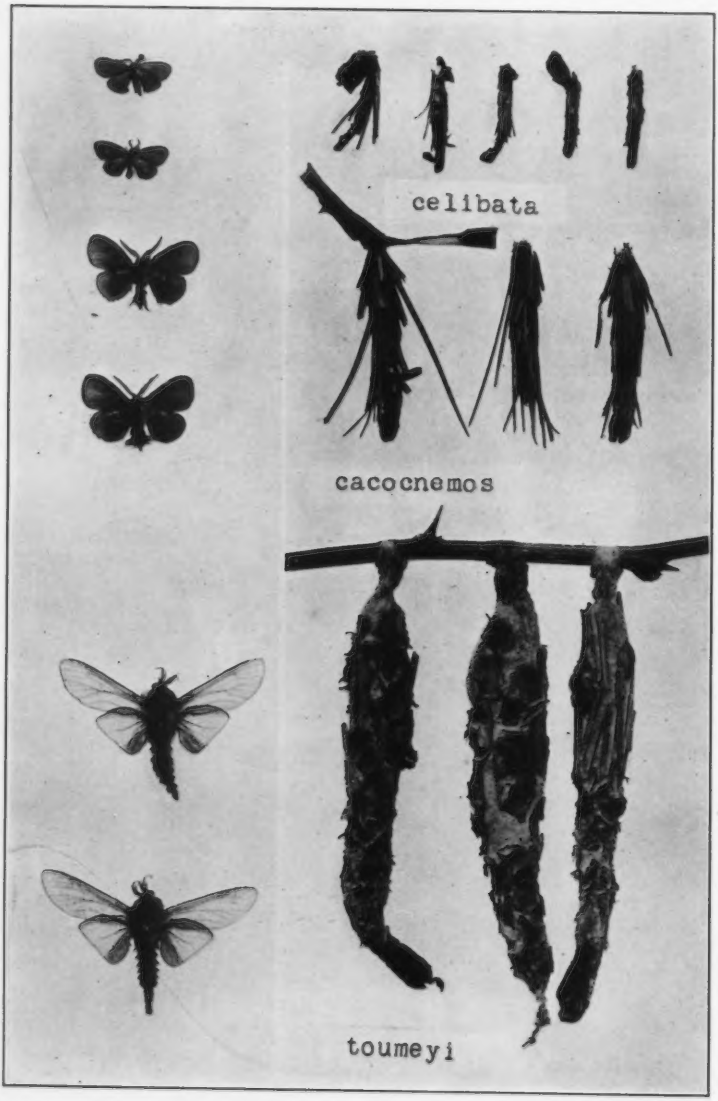

NORTH AMERICAN PSYCHIDAE.—JONES.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES, PHILADELPHIA

VOL. XXXIII MAY, 1922 No. 5

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Two New Psychids, and Notes on Other Species (Lepidoptera, Psychidae.)

By FRANK MORTON JONES, Wilmington, Delaware.

(Plates VII, VIII)

Of our North American *Psychidae*, four species, *confederata* Grt., *carbonaria* Pack., *fragmentella* Hy. Edw., and *tracyi* Jones have been referred to *Eurycyttarus* Hampson, originally created as a sub-genus of *Psyche* Schrank for the reception of an insect from the Nilgiri District, India. In this sub-genus the anal vein of primaries sends a single branch to the inner margin, "vein 6" is absent from both wings, and the anterior tibiae are not spurred; in the two species whose descriptions follow, however, and in *tracyi* Jones, the primaries lack even the basal portion of 1*c* (Comstock's 1st anal), a condition not shown in Hampson's illustrations of the venation of *Psyche* or of any of its sub-genera. Since, however, by Hampson's tables, and by that of Neumoegen & Dyar in our own literature, these insects run out to *Eurycyttarus*, and until a detailed comparison with the world-species permits their more accurate placing, it seems best, for the present, to leave them there.

In both 1919 and 1921 the larval cases of one of the new species were found in considerable numbers, attached to tree-trunks, at DeFuniak Springs, Florida. The life-cycle of this insect is apparently similar to that of *confederata* Grt., for in mid-May the larvae creep up from the ground and attach their cases to the bark, preliminary to pupation. Where oaks and pines grow together, oaks are preferred; and the cases are rarely found more than five feet from the ground. From numerous cases gathered about May 20, forty males emerged, but not one female; and since none of the remaining cases contained female pupae, the conclusion seems inevitable that the female larvae must have sought out other and different situations for the suspension of their cases. This habit does not seem to have been recorded for any of our North American *Psychidae*, though it has been noted at length (Hofman, Berl. Entomol. Zeitschr., IV) of European species. For this insect is proposed the name of

Psyche (Eurycyttarus) celibata n. sp. (Plates VII, VIII).

Larval case.—Roughly cylindrical, 15 mm. in length; of coarse texture externally, the material overlaid upon the silken tube consisting of thin flakes of pine bark, and a few short bits of dry pine-needles or fine grass-stems irregularly applied longitudinally and not usually projecting far beyond the extremity of the case.

Larva, just before pupation.—Length, 9 mm.; width of head, .9 mm. White; the chitinized areas of the thoracic segments dark brown, with the usual narrow longitudinal white lines. Head dark brown, almost black, with the front (or at least its upper portion) white; three oblique white bars on each epicranium, the upper and longest extending to the adfrontal sclerite; the frontal punctures inconspicuous, the frontal setae opposite them, and the 2nd adfrontals slightly higher. Prothoracic spiracle not regularly oval, almost as high as wide. Primary body-setae present, as indicated in the illustration.

Pupa of ♂.—Length 6 mm.; dull amber brown, darker dorsally, the eyes dark brown. Front smoothly rounded. The mesothoracic wings extend halfway across the third abdominal segment; the prothoracic legs and the antennae extend almost to the caudal margin of the wings; the mesothoracic legs reach the wing-margin, and the metathoracic legs slightly exceed the margin. Abdominal segments 8, 9 and 10 are curved ventrad; the two caudal hooks are large, each terminating in a sharp thorn. The dorso-cephalic portions of the abdominal segments are finely striated, and from the dorso-cephalic margin of segments 6, 7

and 8 projects a toothed ridge,—the teeth directed caudad,—successively more prominent in the order named, and forming a conspicuous comb-like projection on the 8th segment. The usual dorso-caudal row of fine short spines, their points directed cephalad, occur on abdominal segments 3, 4 and 5. The spiracles are raised above the body surface.

The pupal stage lasts about four weeks.

Adult ♂.—Expanse 10.5 to 12.5 mm. Brownish black, the wings broad and much rounded. Vestiture of head, thorax and abdomen rather long, hairy and erect, with an admixture of white hairs. In dried examples the abdomen rarely exceeds the margin of secondaries. The scaling of the wings is uniform and moderately dense, the costa of primaries narrowly darker. The primaries have 11 veins, the secondaries 7. The venation of ten examples was studied in detail, the primaries showing no significant variation, and the extreme range found in the secondaries is exhibited on Plate VIII, the first figure showing the more usual condition.

Described and illustrated from numerous bred examples; the *type* is in the collection of the author, and paratypes will be distributed. *Type locality*, DeFuniak Springs, Walton County, Florida. Larvae and cases apparently identical were also collected near Wilmington, North Carolina. Dates of emergence (1921) ranged from May 24 to June 22.

The larval cases and larvae of a second and larger species have been turned up at intervals throughout the last few years, from localities ranging from North Carolina to south and west Florida, and by several collectors including the author, who, however, did not succeed in breeding the moth until the autumn of 1921. It proves to be a close ally of *tracyi* Jones. An interesting difference between the two species is in the size of the legs of the adult males, shown, at the same scale, on Plate VIII. This seems to be correlated with a difference in the female cocoons, to which the males must cling in mating. That of *tracyi* (see Entomological News XXII, May, 1911, Plate VI) is wide and blunt at its extremity, while that of the new species is more slender,—or rather, the silken tube is almost bare of thatching material at its lower end. Because of this "weak-legged" condition, for this insect is proposed the name of

Psyche (Eurycyttarus) cacocnemos n. sp. (Plates VII, VIII).

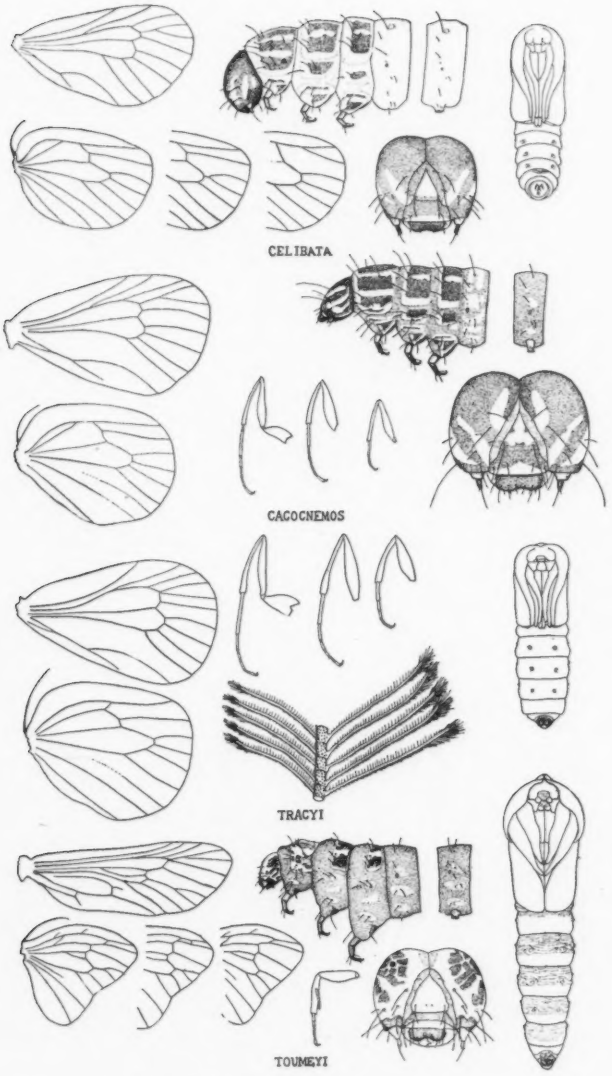
Larval case.—Length, 25 to 30 mm. Similar in type to that of *tracyi*,

but the thatching material,—flat bits of grass or sedge, sometimes slender rush,—is much less evenly arranged and the fragments are less uniform in size. Especially on the case of the ♂, a few much longer pieces, sometimes pine needles, are attached to its upper portion, often projecting beyond the lower extremity of the case. The lower half of the case bears fewer and shorter pieces, usually showing the silken tube in part; and the general effect is of a shaggier, more slender and tapering case than that of *tracyi*.

Larva, last stage.—Length, 15-20 mm.; width of head, 2.1 mm. Pale dull grayish brown; the head and the strongly chitinized portions of the thoracic segments are dark brown with white markings, which are continued less conspicuously on the setal plates of the immediately succeeding abdominal segments, fading out caudally. The pale markings of the thoracic segments consist of the usual narrow longitudinal lines and the margins of the chitinized plates. Though the proportion of light and dark is variable, the conspicuous head-markings usually consist of three oblique bars on each epicranium, in a symmetrical distribution of light and dark areas on the front, and in a horseshoe-shaped band whose arms reach the adfrontal sclerites between the adfrontal setae. The 2nd adfrontal, the frontal puncture, and the frontal seta are almost in line, the latter falling very slightly below a line drawn joining the other two.

Pupa of ♂.—Length 10-11 mm. Structurally similar to that of *tracyi*, but dark chestnut brown in color (*tracyi* is reddish amber), more rugose and less polished than that species. The mesothoracic wings overlap a portion of the third abdominal segment, ventrally; the mesothoracic legs and the broad antennae extend to the wing-margin, and the prothoracic legs almost reach the margin. The cephalic portions of the abdominal segments, especially dorsally, are striately rugose. A short spiny dorso-cephalic ridge, the teeth directed caudad, is present on segments 3, 4, 5, 6, 7 and 8, low and indistinct on 3, 4 and 5, thence progressively more prominent, on 8 expanding into a leaf-like appendage. Segments 3, 4, 5, 6 and 7 each bears a dorso-caudal row of fine short spines, their points directed cephalad. The caudal segments are curved ventrad, each caudal hook terminates in a single thorn, and the abdominal spiracles are raised slightly above the body surface.

Adult ♂.—Expanse, 17 mm. Blacker (less brown) than *tracyi*. The antennae are broadly bipectinate, with 30-34 joints (in the several species examined the number of joints proved variable, and the apparent 3rd joint bearing more than two pectinations was counted as a single joint). As in *celibata* and *tracyi*, the shaft and its pectinations are scaled on one side with semi-appressed hair-like scales. Compared with *tracyi* of approximately the same robustness and wing expanse, the legs are shorter and more slender, the primaries are apically more



NORTH AMERICAN PSYCHIDAE.—JONES.

acute, the secondaries are proportionately longer and narrower. The caudal segments of the abdomen are widely tufted laterally. The end of the cell of primaries is obscurely marked with a vertical black bar. In both species (*cacocnemos* and *tracyi*) the primaries have 11 veins, the secondaries 7, the anal veins of primaries as in *celibata;* the illustrated difference in the radial veins of primaries is not specific, but occurred in both species; in the limited number of examples available for detailed study the differences shown in venation of secondaries were apparently specific.

Adult ♀.—Of the usual grub-like form. Length, living, 11 mm.; the chitinized dorsal portions of the thoracic segments are pale straw-yellow, and the abdominal band of downy hair is very pale dull fawn-color.

Described and illustrated from 5 males and 1 female, bred from larvae collected near Jacksonville, Florida. The author has collected similar cases, some of them containing living larvae, near Wilmington, N. C.; at Summerville, S. C.; at DeFuniak Springs, Walton Co., Florida; other records include Tampa, Florida (E. L. Bell), and Lakeland, Florida (J. A. Grossbeck). The larvae of this insect are found feeding, in open and sunny places, upon sedges, grasses, rushes, sometimes on low growing herbaceous plants, occasionally on shrubs growing among these, and they reach their full growth in spring or early summer. Of 80 larvae brought from Florida to Delaware in early June and confined with growing plants out of doors, where they fed intermittently throughout the summer, only a few survived to pupate in September and October, the moths emerging the same season. *Tracyi*, as far as we have records, emerges in the spring.

The *types* and paratypes are in the collection of the author.

Oiketicus toumeyi Jones (Plates VII, VIII).

In Entomological News XXXIII, 1922, page 12, a new *Psychid* from Arizona was briefly described as *Oiketicus toumeyi*. In mid-April, 1918, the larvae of this insect were found in abundance on locust trees growing along the city streets of Tucson. Some had already spun their cases fast for pupation, others were about to do so, and no early stage larvae were observed. The foliage showed little signs of feeding, and these conditions were interpreted to indicate that this

insect hibernates as a full-grown larva. Emergence of the moths took place from June 15 to July 3. It is now possible to publish illustrations of this insect, and some additional descriptive matter:

Larval case.—Length usually from 60 to 70 mm., but occasionally exceeding 100 mm.; diameter at widest part about 10 mm. For pupation usually suspended from a twig by a strong encircling band of silk, below which the case widens abruptly, thence of almost uniform diameter for about two-fifths of its length, then tapers to the lower extremity. It is composed of tough grayish-white silk, of which usually a considerable portion is bare of attached material; this may consist of bits of slender sticks or of leaf-stems, applied longitudinally, or of dry leaf-fragments, or of both of these materials in indiscriminate mixture.

Last stage larvae.—Length 40-60 mm.; width of head 3.9 mm. Dull brown; the head and the chitinized areas of the thoracic segments, less conspicuously the setal plates of the abdominal segments, almost white. The head and the thoracic shields bear foliated markings of dark brown, and most of the setae of the head and thorax arise from dark brown dots. The markings of the head are asymmetrical, though not always to the extent illustrated. A line drawn from the 2nd adfrontals through the bases of the frontal setae also touches the upper margin of the frontal punctures.

Pupa of ♂.—Length 21 mm.; chestnut brown, the head, thorax and wings lighter than the abdomen, which is more conspicuously and striately rugose, especially its dorsal portions. The front terminates in a sharp median ridge with flattened lateral expansions along the epicranial suture. The mesothoracic wings only slightly overlap the third abdominal segment ventrally. The antennae are broad and short, their apices reaching a point midway from the frontal crest to the caudal margin of the wings; the prothoracic and mesothoracic legs reach points respectively two-thirds and three-quarters the distance from the crest to the margin of the wings. The caudal segments are curved ventrad, and the caudal hooks are heavily chitinized, almost black, and bear single thorns. A dorso-cephalic spined ridge, its strong teeth directed caudad, occurs on each of abdominal segments 3, 4, 5, 6, 7 and 8; and a dorso-caudal row of fine bent spines, their points directed cephalad, on each of segments 2, 3, 4 and 5. The abdominal spiracles are produced beyond the surface of the body.

Adult ♀.—Length 24-30 mm. Of the usual form, more nearly resembling the ♀ of *abboti*, rather than that of *ephemeraeformis*. The crest-like medio-dorsal ridge of the thoracic segments is high and sharp, and caudally the body is truncated rather abruptly. The abdominal ring of downy hairs is less abundant in quantity, paler in color, and less evenly distributed than in *abboti*.

The wing-venation of 18 males of *toumeyi* was studied in detail and the more significant variations illustrated, together with the fore tibia with its strap-like appendage. The illustrations of this and other species (Plates VII, VIII) are almost self-explanatory, though it might be noted that no effort was made to indicate the very inconspicuous pupal setae.

The generic references of these four insects are admittedly unsatisfactory; but not only the literature of exotic species, but more complete knowledge and representative series of the insects themselves are requisite for a better understanding of this puzzling and interesting group. "One is compelled to conclude" (Tutt, British Lepidoptera, II, 127, 1900) "that the higher Psychids are almost unknown, so far as their relationships to each other are concerned."

Descriptions of New Genera and Species of the Dipterous Family Ephydridae.—V.*

By EZRA T. CRESSON, JR., Academy of Natural Sciences, Philadelphia, Pa.

Plagiops hinei new species.

Black; antennae, apices of tibiae and all tarsi, yellow. Halteres black. Wings yellowish-hyaline, with extreme base blackened. Sculpturing of frons and face medianly, strongly granulose, that of mesonotum and scutellum in form of minute pits. Face with the broad parafacialia yellowish. Abdomen and face somewhat metallic green. Length 2.3 mm.

Type.— ♀ ; Puerto Barrios, Guatemala, March 3-14, 1905 (J. S. Hine). [Ohio State University Collection.]

Peltopsilopa schwarzi new species.

Black; antennae, including arista, tibiae and tarsi, yellow. Halteres black. Entirely highly polished, metallic blue, green or purple. Wings yellowish; extreme base blackened. Length 2 mm.

Type.— ♂ ?; Cayamas, Cuba, May 16 (E. A. Schwarz). [U. S. N. M., No. 25309.] *Paratype.*—1 ♂ ?; topotypical.

Ceropsilopa dispar new species.

Black; apices of tibiae and all tarsi yellow. Halteres white. Wings hyaline with pale veins. Shining species; face polished. Frons with a narrow transverse depression above antennae. Face weakly convex, not prominent medianly. Length 1.75 mm.

* For paper IV see Ent. News, xxviii, 340-341, 1917.

Type.—♀; San Diego County, California, March 12, 1907. [Washington State College Collection.] *Paratype.*—1 ♀; San Diego, California, June 30 (M. C. Van Duzee).

Ceropsilopa coquilletti new species.

Legs, including coxae and apices of tarsi, yellow. Shining to polished with little or no metallic tints. Face narrow, strongly, transversely convex, and transversely sculptured, especially on lower portion, giving it a subopaque appearance. Length 2.75 mm.

Type.—♀?; Pacific Grove, California, October 7, 1906 (J. C. Bradley). [Cornell University Collection.] *Paratypes.*—2 specimens; topotypical.

LEPTOPSILOPA new genus.

This genus is proposed for the reception of those *Psilopa*-like species having a sculptured, more or less transversely wrinkled face; facial bristles high, about middle of facial profile, and the black fore tarsi noticeably thickened.

Genotype.—Psilopa similis Coquillett, 1900.

Leptopsilopa lineanota new species.

Very similar to *similis* Coq. with its fore coxae, middle and hind femora pale, but differs from that species by the infuscation of the wings occupying the first posterior cell except its base. The wings are narrow, pointed. Length 2.25 mm.

Type.—♂; Paraiso, Canal Zone, Panama, February 7, 1911 (A. Busck). [U. S. N. M. Coll., No. 25310.] *Paratypes.*—1 ♂, 2 ♀; topotypical. 1 ♀; Corazal, Canal Zone, Panama.

Leptopsilopa subapicalis new species.

Very similar to *similis*, but the distal infuscation of the wings is confined to a narrow, subapical fascia at the tip of the second vein; fore coxae, middle and hind femora pale. Length 2.5 mm.

Type.—♀; Port of Spain, Trinidad (Ujhelyi). [Hungarian National Museum Collection.] *Paratype.*—1 ♀; topotypical.

Leptopsilopa nigricoxa new species.

Simulating *subapicalis*, but the fore coxae are black and the fore femora pale; wings distinctly maculate. Length 2.5 mm.

Type.—♂; Asuncion, Paraguay, 1905 (Vezenyi). [Hungarian National Museum Collection.] *Paratypes.*—1 ♂, 1 ♀; topotypical.

Psilopa skinneri new species.

Similar to *fulvipennis* Hine, but the head is not so broad, and the mesonotum and scutellum more convex and scarcely sculptured. Head, thorax and abdomen, coxae, femora and halteres black. Face flattened,

not highly polished, with a sparsely polliniferous median stripe. Wings yellowish with dark base. Length 2.5 mm.

Type.— ♀ ?; Guantanamo, Cuba, February 10, 1914 (Henry Skinner). [A. N. S. P., No. 6346.] *Paratypes.*—2 ♀ ?; topotypical.

Psilopa olga new species.

Very similar to *P. leucostoma* Meigen of Europe, which also occurs in our fauna. In the present species the antennae and legs except the tarsi are black. The wings have a distinct fuscous spot at the tip of the third vein and a faint one at the tip of the fourth.

Type.— ♂; Olga, Washington, July 26, 1909 (A. L. Melander). [Washington State College Collection.] *Paratypes.*— 2 ♂, 2 ♀; topotypical.

Psilopa dimidiata new species.

Very similar to *Psilopa olga*, but less polished; face more shining with scarcely noticeable white pollen, and in profile more convex; cheeks narrower; wings at most with traces of spots at tips of veins. Length 2 mm.

Type.— ♂; Chatcolet, Idaho, August, 1915 (A. L. Melander). [Washington State College Collection.] *Paratypes.*— 3 ♂, 6 ♀; topotypical.

Trimerina adfinis new species.

Black; antennae except third joint above and apices of tarsi, yellow. Middle and hind femora and hind tibiae somewhat brownish. Palpi brownish. Halteres white. Wings brownish; cross veins clouded, and brown spot at tip of submarginal cell. Shining, at most thinly grayish or brownish pruinose. Face subopaque, grayish white. Mesonotum and scutellum faintly and minutely punctured. Latter noticeably bronzed. Head in profile flattened, with frons and face nearly vertical. Face long; median area transversely convex, with two bristles each side. Mesonotum without prescutellars, but with setulae distinctly seriated. Abdomen with lateral margins revolute. Length 2 mm.

Type.— ♀; Kaslo, British Columbia, February ? (R. P. Currie). [U. S. N. M., No. 21843.] *Paratype.*—1 ♀; topotypical.

Discocerina aliena new species.

Black, with bases of tarsi pale. Halteres white. Wings hyaline, with dark veins. Shining to polished; frons more obscured, brownish, becoming whitish anteriorly. Face opaque, silvery or white, flattened below, or with slight median swelling; foveae shallow; one bristle present at slightly below middle of profile; parafacials linear. Length 3 mm.

Type.— ♂; Berkeley, Alameda County, California, February 23, 1908 (Cresson). [A. N. S. P., No. 6347.] *Paratypes.*—2 ♂, 1 ♀; topotypical.

Enallagmas Collected in Florida and South Carolina by Jesse H. Williamson with Descriptions of Two New Species (Odonata, Agrionidae).

By E. B. Williamson, Bluffton, Indiana.

(Continued from page 118)

The male of *concisum* runs out in Calvert's key to *pictum*, which species it resembles very closely, the only reliable character for their separation I have detected being in the distinctly longer and differently shaped abdominal appendages of *concisum*. A small color difference seems to be constant: in *pictum* the second lateral thoracic black stripe is abruptly narrowed at three-fourths or two-thirds its length to narrow line for the anterior fourth or third of its length; in *concisum* the stripe widens almost uniformly from its most anterior end to the posterior end.

In Calvert's key to the known females of the group, *concisum* has the wide black humeral stripe of his first division, but due to the shortening of the mesostigmal lamina (hence the specific name), the meeting of the black stripe and the lower end of the mesostigmal lamina is by a point only. *Concisum* would then run out to *pictum*, from which species it is separated in the following key which is supplementary to Calvert's key.

In *concisum* (and *pictum*) the pale colored legs of the female, with the femora conspicuously dark on the dorsum, are in marked contrast with the orange, and entirely unmarked, legs of the male. Also it is a curious fact that in *concisum*, where the male abdominal appendages are conspicuously longer than in its near ally, *pictum*, the female mesostigmal laminae, which these appendages grasp, in *concisum* are much shorter than in *pictum*, but in the single female of *concisum* I have seen there is on either mesinfraepisternum, near its upper edge, and below the lower edge of the mesostigmal lamina, a distinct small round contact point which, in all likelihood, is engaged, during mating, by the supero-internal subapical hook of the superior appendage.

Key to known female Enallagmas of the pollutum group.

1. Black humeral stripe not touching the lower end of the mesostigmal lamina, pale antehumeral stripe wider than the black humeral, second lateral thoracic suture with a black stripe on its uppermost fourth or fifth only. .....*vesperum*

1'. Black humeral stripe touching the lower end of the mesostigmal lamina 2

2(1'). Dorsum of segment 10 pale colored.....3

2'. Dorsum of segment 10 black; prothoracic dorsal pits small, each with a small pale area anterior and adjacent to it.....5

3 (2). Prothoracic pits large, situated near the anterior border of the middle lobe, a pale area posterior and external to each. Mesostigmal lamina black, a pale stripe from and including the dorsal tubercle downward and forward across the lamina; the lower end of the lamina deeply indenting the mesinfraepisternum, *signatum*

3'. Prothoracic pits smaller, situated at or near the mid-length of the middle lobe, pale color adjacent to each more extensive anterior to it or to its level, rather than posterior to it.....4

4 (3'). Mesostigmal lamina barely touching the mesinfraepisternum. Anterior end of the antehumeral pale stripe bordered with a broad stripe of black on the mesostigmal lamina, which black widely separates the antehumeral stripe from the pale vertical stripe on the lamina.....*sulcatum*

4'. Mesostigmal lamina slightly but distinctly indenting the mesinfraepisternum. Antero-mesal end of the antehumeral pale stripe very narrowly separated by black from the extensive pale area of the mesostigmal lamina.....*pollutum*

5 (2'). Prothoracic dorsal pits situated anterior to the middle of the middle lobe. Dorsal tubercle of the mesostigmal lamina pale colored, from which a narrow pale stripe runs downward and forward across the lamina; posterior to this pale stripe the lamina is broadly black, grooved, and with its lower end very slightly indenting the mesinfraepisternum; the extensive black on the lamina widely separates the lower end of the pale antehumeral stripe from the pale stripe on the lamina, or, to express it in possibly a better way, the dorsal and humeral black stripes are broadly joined by a black bar across the mesostigmal lamina, *pictum*

5'. Prothoracic dorsal pits situated at about mid-length of the middle lobe. Dorsal tubercle of the mesostigmal lamina pale colored, from which a pale line extends downward to or nearly to the lower end of the lamina, the lower half of this pale line expanded to cover the lamina to its anterior border; apparently the mesostigmal lamina, the ventral mesostigmal plate and the mesepis-

ternum converge to a point on the edge of the mesinfraepisternum (see paragraph, middle of page 374, Calvert, loc. cit.); dorsal and humeral black stripes narrowly joined by a black stripe on the mesepisternum-mesostigmal lamina suture .....*concisum*

Enallagma signatum Hagen. Fort Myers, Florida, March 4 and 11, 1921, 3 ♂; Enterprise, Florida, April 16 and 20, 1921, 2 ♂, 1 ♀, all by J. H. Williamson. At Fort Myers the specimens were collected on a small creek just west of a cemetery about half a mile east of town. At Enterprise the specimen taken April 20 was captured at a small swamp on the south side of the railroad one mile east of the station.

In these Florida specimens the male superior appendages are in every case slenderer than in all other specimens I have seen.

Enallagma pollutum Hagen. Miami, Dade County, Florida, Everglades, January 23, 1899, S. N. Rhoads, 3 ♂; Fort Myers, Labelle, Moore Haven, Palmdale and Enterprise, Florida, for dates see first paragraph of this paper, J. H. Williamson, 313 ♂, 104 ♀, a few tenerals and many pairs taken in copulation, most of the specimens taken at Fort Myers, Moore Haven and Palmdale, while at Labelle and Enterprise the total catch for both stations was 9 ♂ and 4 ♀.

At Fort Myers, Mr. Williamson noted: "Taken along shady stretches of a small, mucky-bottomed creek where it flows through orange groves. Easily caught as they rested on green vegetation at the water's edge." At Moore Haven he noted: "Taken in large numbers along sun-exposed drainage ditches; vegetation in water and on ditch banks scanty." And at Palmdale: "Frequented floating, grass-like vegetation in shallow, running water at shaded parts of Fisheating Creek." Generally the Enallagmas of the *pollutum* group are lake or pond species; *pollutum* however seems to prefer streams.

A pair taken March 30, 1921, at Moore Haven is preserved with the male appendages in position grasping the female. In these specimens, the apices of the male inferior appendages are just above the dorsal prothoracic pits of the female, and confirm Dr. Calvert's suggestion that the appendages, in copulation, engage the pits. The externo-superior branch of the superior appendage grasps the mesostigmal lamina of the female, the anterior raised border of the latter fitting in the concavity between the externo-superior branch and the interno-

inferior lamella of the superior appendage, the latter lamella of which overlaps and engages the anterior border of the meso-stigmal lamina.

In tenerals of both sexes the yellow or orange color of adults is replaced by pale blue, yellowish appearing first on the face and frons. Abdominal segment 9 of the female has the dorsal black of nearly uniform width in nearly every case, rarely the apical third or fourth is abruptly narrowed and more rarely the dorsal black is triangular in shape, but, as indicated by Hagen's original description and contrary to Calvert's description (p. 378, loc. cit.), the black may not reach the apex of the segment by a distance of sometimes as much as nearly one-third the length of the segment, though usually the color is as described by Calvert. The pale postocular spots in both sexes are also not constant and I have seen males in which the spots might properly be described as more nearly linear than cuneiform.

In Hagen's original description of the male *pollutum*, abdominal segment 9 and the sides of 10 are blue. This is true only of very teneral specimens. Dr. Calvert arrived at his determination of *pollutum* by sending drawings and notes to Mr. Banks for comparison with the Hagen types. To further confirm the matter I sent specimens to Mr. Banks, who carefully compared the Fort Myers specimens, collected by Mr. Williamson, with the seven specimens in the Hagen collection. Mr. Banks not only compared the abdominal appendages but carefully checked the color patterns of head, thorax, legs and abdomen, and he writes that the two sets of specimens are identical, and that the "blue" of segment 9 is certainly an error.

In a letter of November 6, 1921, Dr. Calvert writes: "Laurent recently sent me some *E. pollutum* he took at Gunntown, Florida, last March, one male of which had a pair of orange stripes, transverse to the main axis of the body, on the disk of the nasus and orange twin spots on the dorsum of the mid prothoracic lobe as in the female; pale antehumeral and black humeral stripes each .37 wide at mid-height. Abdomen ♂ 28, ♀ (in copulation therewith) 27; hind wing ♂ 17.5, ♀ 19."

Enallagma vesperum Calvert. Palmdale, Florida, April 7, 1921, 1 ♀; Kathwood, Aiken County, South Carolina, May 4 and May 5, 1921, 2 ♂, 1 ♀, all by J. H. Williamson.

The South Carolina specimens were sent to Dr. Calvert who pronounced them *vesperum*. The Palmdale female is certainly

identical with the Kathwood female. Of one of the Kathwood males Dr. Calvert writes: "This male is a gynandromorph in so far as the mid prothoracic lobe is concerned, having asymmetrical pits."

Enallagma geminatum Kellicott. Kathwood, Aiken County, South Carolina, May 5, 1921, 22 ♂, 11 ♀, J. H. Williamson.

The dorsal prothoracic pits of the female first figured by Garman, but not mentioned in his text (Bulletin Ill. State Lab. Nat. Hist. Vol. XII, 1917), and first discussed by Calvert (Gundlach's Work on the Odonata of Cuba, 1919), are present, in addition to the species of the *pollutum* group, in *geminatum, hageni, recurvatum* and possibly in others, certainly, in a modified form, in others.

Enallagma divagans Selys. Kathwood, Aiken County, South Carolina, April 29-May 9, 1921, J. H. Williamson, 35 ♂, 7 ♀.

Enallagma exsulans Hagen. Enterprise, Florida, April 15, 1921, 2 ♂; Kathwood, Aiken County, South Carolina, April 29 and May 4-7, 1921, 41 ♂, 19 ♀; all by J. H. Williamson.

Enallagma doubledayi Selys. Enterprise, Florida, April 18, 19, 20, 21, 22 and 25, 1921, 178 ♂, 20 ♀; Kathwood, Aiken County, South Carolina, April 29, 1921, 1 ♂; all by J. H. Williamson.

At a five acre swamp, about three-eighths of a mile from Gleason's Pond, near Enterprise, Mr. Williamson noted: "Very abundant in a swampy tract, water and muck half-knee deep, grown up with scattered bushes, waist to shoulder high. This species and *Erythrodiplax minusculum* were so numerous they were a nuisance. *Lestes vidua* was hard to see." Elsewhere in his notes he remarks that *E. doubledayi* was much rarer at the four ponds about four miles east of Enterprise, and from a quarter to a half a mile north of the railroad, than at the ponds and swamps north of town.

Enallagma durum Hagen. Labelle, Florida March 25 and 26, and Enterprise, Florida, April 16 and 20, 1921, 8 ♂, 1 ♀, J. H. Williamson.

At Labelle Mr. Williamson noted: "Rested on reed tips in the river or flew swiftly over the river close to the water's surface." And at Enterprise: "Flies over Lake Monroe, close to the surface, and occasionally alighting on reeds." Crossing

Lake Okeechobee on motor launch on April 9: "Tenerals of *E. durum*, *E. pollutum* and *Ischnura ramburii* were found resting on railings and woodwork on the boat."

Enallagma cardenium Hagen. Miami, Dade Co., Florida, January 24, 1899, S. N. Rhoads, 5 ♂; St. Petersburg, Florida, April 16, 1908, Mrs. C. C. Deam, 1 ♂; Fort Myers, Labelle, Palmdale and Enterprise, Florida, for dates see first paragraph of this paper, J. H. Williamson, 111 ♂, 8 ♀; 75 ♂ and 6 ♀ of the above catch were taken at Ft. Myers.

The form of the male superior appendage is practically identical in all the Florida specimens I have seen. In superointernal view the inferior lamella is about like Calvert's figure 40a while the superior branch is slender, like his figure 44a, but apically hooked as in figure 38a. Males vary in size from abdomen 26 to 30, and in some the wings are slightly brown tinged.

This species is dull and quite un-Enallagma-like in color. Moreover there is an almost universal loss or obscuring of color due to postmortem changes in preserved material. Mr. Williamson made the following notes on living colors: "Eyes largely black, paler beneath; postocular spots dull violet gray. Thorax dull violet, marked with dark stripes, the middorsal stripe metallic black. Abdominal pale markings same shade of dull violet as the pale color of thorax."

At Palmdale Mr. Williamson noted: "Frequented floating water hyacinths in running water, sandy-bottomed stretches of Fisheating Creek."

A male taken at Ft. Myers on March 4, 1921, has an ant's head firmly attached by the mandibles to the left middle tarsus at about one-third its length. This specimen was sent to Dr. F. M. Gaige, who reports that the head is a male *Pseudomyrma* species. Dr. Gaige informs me that the males are all winged and that most of the species are arboreal. It is possible the dragonfly may have seized the ant in the air or the attack may have been made when the ant was running about over vegetation. Dr. Gaige has also identified the head and thorax of another ant attached to the legs of a *Hetaerina laesa* from British Guiana. In this case the ant is a *Pheidole* species, and the head and thorax belong to a minor worker. Dr. Gaige writes that many species of *Pheidole* forage on vegetation to

the height of several feet and that they are "pugnacious little devils." Such an ant might conceivably seize a resting dragonfly by its legs, but I have little doubt that the dragonfly was the aggressor and that it plucked the ant from its perch, and the ant retaliated by seizing a leg in a death grip. I have elsewhere recorded tropical dragonflies with heads of stingless bees attached to their legs.

New North American Coleoptera.

By A. B. CHAMPLAIN and J. N. KNULL, Bureau of Plant Industry, Harrisburg, Pa.

The following paper presents a number of apparently undescribed species in our collection. The specimens were not taken in any particular region, but represent material collected and received from various sources, as indicated in each description.

We are indebted to Prof. H. C. Fall, who has been of great assistance to us in examining specimens, and for his opinions in regard to the material; also to Dr. Henry Skinner and E. T. Cresson, Jr., for the use of the Horn collection.

Chrysobothris woodgatei n. sp.

Robust, depressed, piceous, elevated spaces shining, ventral surface with coppery bronze lustre. Head densely punctate and rugose, with long white pubescence. Clypeus broadly emarginate at middle, arcuate each side. Antennae coppery bronze, third joint longer than following joints, joints four to eleven, gradually narrowed.

Prothorax twice as wide as long, widest in front of middle, obliquely narrowed in front, arcuately narrowed toward base, surface convex, a deep median densely punctate sulcus; a broad, smooth, slightly elevated space on each side, a narrower sinuous elevated space nearer to the side, the surface otherwise coarsely and densely punctured, punctures with long white hairs. Scutellum small, triangular.

Elytra wider than prothorax, widest back of middle, sides parallel near base, sinuate in middle, rounded on posterior third to broadly rounded apices, lateral margin serrulate along its entire length, disk convex, first costa expanded into a smooth area on basal half, apical half a raised line, second and third costae somewhat interrupted into broad, smooth sinuate areas, fourth costa a raised line parallel to lateral margin, intervals very densely and finely punctate.

Prosternum lobed in front, pubescent, with median smooth area. Last ventral segment of abdomen serrulate along margin, submarginal ridge not well marked, abdomen densely and irregularly punctate.

Length 14 mm.

♂. Last ventral segment with a semi-circular emargination, anterior tibia arcuate, with a lamina on the inside near tip, forming an abrupt dilation, middle tibia similar to the first, but tooth not as pronounced, posteror tibia straight.

♀. Last ventral segment with a narrow emargination, anterior tibia arcuate, dilate at tip, but without a tooth.

Described from one male and two females collected at Jemez Springs, New Mexico, in July, by John Woodgate, in whose honor the species is named. *Type* material in authors' collection.

According to Horn's* table, this species would come near *C. quadrilineata* Lec.

Mastogenius castlei n. sp.

Head and prothorax bright metallic blue, elytra metallic green, cupreous along costal margin, a piceous spot in middle which extends posteriorly along suture, ventral surface including legs aeneous. Head convex, impressed in front, coarsely and densely punctate, eyes small, coarsely granulate. Antennae aeneous, serrate from the fourth joint, first and second joints globose, third joint narrow, elongate, shorter than the fifth and about half as long as fourth.

Prothorax wider than long, widest a little back of middle, sides arcuate, more strongly rounded anteriorly, surface convex, coarsely punctate.

Elytra as wide at base as basal line of prothorax, widest back of middle, side margins parallel at base, sinuate in middle, apices rounded, surface coarsely punctate.

Abdomen sparsely punctate. Posterior margin of hind coxal plate broadly emarginate.

Length 3 mm.

Described from one specimen collected at Miami, Florida, May 4, by Dr. D. M. Castle, in whose honor the species is named. *Type* in authors' collection.

According to Schaeffer's† key, this species should follow *Mastogenius puncticollis* Schaef.

Idoemea bicolor n. sp.

Slender, elongate, pubescent, testaceous; head orange in color. Head wider than prothorax, vertex impressed. Eyes large, coarsely granulate, narrowly separated on vertex, deeply emarginate, upper portion smaller than lower. Antennae eleven-jointed, nearly twice as long as body, covered with short dense pubescence which becomes sparse and

* G. H. Horn—Trans. Amer. Ent. Soc. XIII, 1886, p. 85.

† Chas. Schaeffer—Jour. N. Y. Ent. Soc. V. 26, 1918, p. 214.

longer near base, scape stout, with small concave cicatrix near outer apical margin, second joint very small, remaining joints about equal in length and gradually tapering.

Prothorax cylindrical, dilate at middle, longer than wide, surface unevenly punctate, and with long pubescence, on each side, a dorsal smooth area, and two protuberances, one basal and one lateral.

Elytra wider than prothorax, three-fourths the length of the abdomen, narrowed posteriorly, apices rounded, surface coarsely and unevenly punctate, covered with fine pubescence.

Abdomen sparsely punctate, with short pubescence. Legs with long pubescence.

Length 9 mm.

Described from one specimen collected at Jemez Springs, New Mexico, in August, by John Woodgate. *Type* in authors' collection.

Elaphidion albomaculatum n. sp.

Form of *Elaphidion irroratum* L., brunneous, marked with dense patches of white pubescence. Head with front irregularly punctate, vertex transversely strigate, eyes prominent, coarsely granulate, emarginate, a patch of dense white pubescence in emargination, another patch beside each eye on vertex. Antennae about one-half longer than elytra in male, only slightly longer than elytra in female, eleven-jointed, third, fourth, fifth, sixth and seventh joints bearing a moderate spine on inside, outer joints finely pubescent, punctate.

Prothorax longer than wide, cylindrical, widened in the center, constricted at apex and base, surface irregularly punctate and pubescent, with an irregular smooth callus in center, and another on each side in front and to the rear, also three similar areas along each side; a round patch of dense white pubescence on each side back of anterior margin, another elongate downwardly deflected patch on each side at base, and a small patch in front of scutellum. Scutellum triangular, covered with dense white pubescence.

Elytra wider than prothorax, sides nearly parallel, apices truncate, spinose on the outer side, surface irregularly punctate, punctures becoming obsolete near apex, covered with short pubescence intermixed with longer hairs, marked with irregular patches of dense white pubescence.

Sides of meso, and metathorax, and segments of abdomen with patches of dense white pubescence; abdomen sparsely punctate, pubescent.

Length 13 mm.

Described from three males and one female collected at Miami, Florida, on April 2, by J. N. Knull. *Type* material in authors' collection.

Elaphidion (Anepsyra) delongi n. sp.

Form and color of *Elaphidion* (*Anoplomorpha*) *subpubescens* Lec. Head densely and irregularly punctate. Eyes prominent, coarsely granulate, emarginate. Antenna about a third longer than elytra in the male, slightly longer than elytra in the female, eleven-jointed, pubescent, pubescence longer toward base, third joint with a spine about half the length of the fourth joint, fourth joint with a shorter spine, fifth with small spine.

Prothorax cylindrical, longer than wide, surface densely and irregularly punctate, with a median smooth callus on basal half, long flying hairs numerous. Scutellum densely pubescent.

Elytra wider than prothorax, sides nearly parallel, apices bispinose, surface densely and regularly punctate, each puncture bearing a long white hair, punctures becoming less prominent posteriorly.

Abdomen finely punctate, pubescent.

Length 13 mm.

Described from a male and a female collected at Miami, Florida, on April 3 and April 12 respectively, by D. M. DeLong, in whose honor the species is named. *Type* material in authors' collection.

Anthophilax quadrimaculatus n. sp.

Brunneous, elytra ochraceous, with two piceous spots on each side. Head coarsely and irregularly punctate on vertex, more finely punctate on front. Eyes finely granulate, emarginate. Mandibles long, dark at apex. Antennae eleven-jointed, extending beyond two-thirds the length of the elytra, scape stout, second joint very small, third joint shorter than first, but longer than fourth, fifth joint longer than any preceding joint, remaining six joints approximately equal in length to the fifth.

Prothorax longer than wide, acute lateral tubercle at middle, a deep transverse depression near anterior and posterior margins, base trisinuate, surface deeply and irregularly punctate with median callus, and also a transverse callus near basal margin. Scutellum small, triangular, finely and densely punctate.

Elytra wider than prothorax, sides nearly parallel, rounded in apical fifth to obliquely truncate apices. Surface densely irregularly punctate on basal half, becoming extremely fine toward apex. Color ochraceous, a lateral piceous spot behind humeral angle, and another in middle of elytron.

Abdomen densely punctate and pubescent.

Length 16 mm.

Described from a female specimen collected at Rock Bridge, Ohio, in June, by Robert J. Sim and C. J. Drake. *Type* in authors' collection.

According to Nicolay's* key, this species would fall next to *A. subvittatus* Casey.

Atimia huachucae n. sp.

Piceous, legs and antennae brunneous, covered with coarse luteous pubescence, with some denuded spots on head, prothorax and elytra. Head convex, covered with luteous pubescence, with the exception of a median denuded stripe. Eyes finely granulate, emarginate. Antennae finely pubescent.

Prothorax wider than long, quadrate, disk convex, irregularly densely punctate, covered with luteous pubescence, which becomes sparse, forming a fine central dark area and two rather broad dorsal and lateral vittae. Scutellum quadrate, covered with dense luteous pubescence.

Elytra with sides gradually converging to obliquely truncate apices, surface irregularly punctate, covered with dense luteous pubescence, with numerous irregular smooth, round, denuded areas.

Ventral surface and legs with short luteous pubescence.

Length 9 mm.

Type and *paratype* collected at Cooney, New Mexico, and Huachuca, Arizona, respectively, in the collection of H. W. Wenzel. One paratype collected at Paradise, Arizona, by H. H. Kimball, in authors' collection.

This species resembles *Atima confusa* Say, but can be distinguished easily from this species by the round denuded areas on the elytra.

Leptostylus floridanus n. sp.

Resembling *Leptostylus argentatus* Duv. in form and color. Head clothed with gray pubescence. Eyes coarsely granulate, emarginate. Antennae eleven-jointed, slightly longer than elytra, mottled between annulations.

Prothorax wider than long, with a well developed lateral tubercule, disk convex, with a median raised area on basal half, and two similar areas on each side, surface covered with dense silvery-white pubescence, pubescence darker in front of scutellum, and a faint line on each side. Scutellum densely clothed with silvery-white pubescence.

Elytra wider than prothorax, sides parallel near base, widened on basal half, rounded anteriorly to obliquely emarginate apices, each elytron with three somewhat interrupted raised lines bearing tubercules, and also a row along suture, surface deeply and evenly punctate, clothed with dense silvery-white pubescence on basal two-thirds, apical third and a small patch back of scutellum darker, a piceous stripe running parallel to costal margin from humeral angle to apex, deflected obliquely on basal

* A. S. Nicolay—Jour. N. Y. Ent. Soc. V. 25, 1917, p. 38.

half toward suture, on apical third a second oblique stripe running parallel to the first, and extending from costal margin to suture, a short oblique stripe in center diverging from suture to first raised line.

Femora strongly clavate.

Length 9 mm.

Described from one specimen collected on *Pinus caribaea* at Miami, Florida, on April 3, by J. N. Knull. *Type* in authors' collection.

Some Coccidae Found on Orchids (Hom.).

The following Diaspine Coccidae, found on greenhouse orchids, are of interest on account of the locality and, excepting the first, new host-plant records.

Aonidia pseudaspidiotus (Lindinger).

Parlatoria pseudaspidiotus Lindinger, Insekten Börse, XXII (1905), p. 131.

Female scale about 1.4 mm. diameter, circular or slightly oval, slightly convex; first skin a little to one side of middle, strongly green, varying to cream-color; second skin concealed, enclosing female, dense and chestnut red, but covered with pale secretion, so that in the scale the area around the first skin is whitish; outer part of scale purplish-black, but the thin margin whittish. No thick ventral film.

Female circular, without lateral incisions or projections; three pairs of well-formed lobes, and a fourth small tooth-like one; median lobes widely separated, trilobed; second and third lobes bilobed, the outer lobe small; spines ordinary, small; squames strongly fimbriate, those beyond the third lobe mostly very large, subtriangular; large transverse thickenings below the interlobular intervals; no circumgenital glands; anal orifice elongate, with thickened margins; mouth parts very large.

On stems of *Vanda teres* Lindley, found by Mr. S. Knudsen in a greenhouse at Boulder, Colorado. The orchid belongs to the Indian region, and the scale is undoubtedly an Oriental species.

This species appears to be closely related to *Aonidia crenulata* Green (*A. ebeni* "Green," Leonardi), and in spite of its great resemblance to such species as *Parlatoria pergandei*, I think it is properly an *Aonidia*. *A. pseudaspidiotus* was found on an orchid at quarantine at the port of San Francisco, several years ago.*

Chrysomphalus dictyospermi (Morgan).

On *Coelogyne cristata* Lindley, infesting the leaves. Greenhouse at Boulder, Colorado.

Diaspis boisduvalii Signoret.

On *Laeliocattleya* hybr. *victoriae* ("Queen Victoria," hort.) and *Odontoglossum rossii* Lindley. Greenhouse at Boulder, Colorado.—T. D. A. COCKERELL, Boulder, Colorado.

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* B. B. Whitney, Monthly Bull. Calif. Comm. Hort., July, 1913, p. 583. *Parlatoria mangiferae* Marlatt, apparently the same species as that from *Vanda*, was found on mango, not on orchids. Macgillivray places *mangiferae* and *pseudaspidiotus* (as distinct species) in his genus *Genaparlatoria*.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., MAY, 1922.

The Conservation of Natural Conditions.

The activities of many entomologists are directed toward the destruction of insects on as large a scale as their ingenuity and the material resources at their command will permit. When the insects so destroyed are operating against human life, health, food, clothing, shelter and enjoyment, we applaud the efforts of our economic colleagues. In earlier days in this country we generally approved of the killing of various reptiles, birds, mammals and men who similarly threatened our lives and our property. Later, a portion at least of the American people recognized that some of these animals, including the human species, were, for various reasons, worth saving, especially in those cases where their destruction touched our personal and financial interests. Similar reasons have very lately led to movements for the conservation of forests.

It is well worth considering whether many of our interesting insects are not being threatened with extermination as a consequence of the destruction of the environment on which their existence depends. The fate of some of the British butterflies is an indication of what may happen here. Various movements for the conservation of natural conditions are under way, without respect to financial or commercial considerations but with regard to our intellectual, recreational, esthetic, moral and spiritual advancement. To all such efforts, the support of entomologists should be forthcoming without delay.

Mulford Biological Exploration of the Amazon Basin. News Bulletin No. 7.

The safe return on Feb. 26th of Dr. H. H. Rusby, Director of the Mulford Biological Exploration, was an occasion for rejoicing on the part of his many friends throughout the country.

Cable messages have just brought the information that the other scientists of the Mulford Exploration, who have put in four months of hard work in the Bolivian and Brazilian forests since the time Dr. Rusby left them, are at last on their way home. They are expected to arrive on the Booth Line SS. Justin, at Brooklyn, on April 13th.

This party consists of Dr. W. M. Mann, assistant entomologist of

the U. S. Department of Agriculture, who has been acting as director of the expedition since Dr. Rusby was compelled to leave them on account of ill health; Dr. O. E. White, assistant botanist at the Brooklyn Botanical Gardens and orchidologist of this expedition for Dr. Oakes Ames of the Bussey Institution of Harvard University; Dr. Everett Pearson, ichthyologist of the University of Indiana, who has been collecting fishes on this expedition for the forthcoming work on the fishes of South America by Prof. Eigenmann of Indiana University, reptiles for Dr. Noble of the American Museum of Natural History and batrachians for Prof. Ruthven of the University of Michigan.

Messrs. MacCreagh, Brown and McCarty, the motion-picture photographers, who accompanied the exploration, will remain until the latter part of May. In addition to photographic work, they are at present investigating a special problem for Dr. Rusby concerning the use of certain drug plants among the Indians of the lower Uaupes River and its tributaries near the Brazilian-Colombian frontier.

Dr. Mann reports that all members of his party are in good health and that they are bringing back with them about two and a half tons of scientific material. In addition to the preserved specimens, they have a small menagerie of living animals for the National Zoological Garden at Washington.

These collections, supplementing the very large amount already shipped home and brought home by Dr. Rusby, will form a very notable contribution to the scientific investigation of South America, notwithstanding that the entire period between the time of leaving and of returning to New York is less than eleven months.

Arrangements are being made for a reception to the scientists of this exploration, including a number of their friends and many prominent leaders in the various departments of scientific work represented.

R. H. HUTCHISON, *Secretary*, Philadelphia, Pa.

[The daily newspapers reported the arrival of Messrs. White, Pearson and Mann at New York on April 13.—EDITOR.]

Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

The titles occurring in the Entomological News are not listed.

4—Canadian Entomologist, London, Canada. **10**—Proceedings of the Entomological Society of Washington, D. C. **12**—Journal of Economic Entomology, Concord, N. H. **21**—The Entomologist's

Record, London. **54**—Proceedings of the Biological Society of Washington, D. C. **69**—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. **77**—Comptes Rendus des Seances de la Societe de Biologie, Paris. **82**—The Ohio Journal of Science, Columbus. **90**—The American Naturalist, Lancaster, Pa. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **128**—Zeitschrift fur Induktive Abstammungs- und Vererbungslehre, Leipzig. **138**—American Museum Novitates, New York. **134**—Annales de Biologie Lacustre, Brussels.

GENERAL. Dean, G. A.—How we may increase the effectiveness of economic entomology. **12,** xv, 41-53. **Kelly, E. G.**—Cooperation of agricultural colleges with high schools and rural schools in economic entomology. **12,** xv, 54-62. **Robertson, C.**—The sunflower and its insect visitors. (Ecology, iii, 17-21.)

ANATOMY, PHYSIOLOGY, ETC. Belehradek, J.—Experiences sur la cellulase et l'amylase de la salive chez Dixippus morosus. (Arch. Intern. Physiologie, xvii, 260-65.) **van Bemmelen, J. F.**—On the primary character of the markings in Lepidoptera. (Proc. Sec. Sci., Konink. Akad. Wetensch. Amsterdam, xxi, 58-67.) **Bowen, R. H.**—Studies on insect spermatogenesis. **100,** xlii, 53-84. **Bridges, C. B.**—The origin of variation in sexual and sex limited characters. **90,** lvi, 51-63. **Crampton, G. C.**—A comparison of the first maxillae of apterygotan insects and crustacea from the standpoint of phylogeny. **10,** xxiv, 65-82. **Godoelst, L.**—Le trimorphisme larvaire des Oestrides. **77,** lxxxvi, 501-4. **Kennedy, C. H.**—The homologies of the tracheal branches in the respiratory system of insects. **82,** xxii, 84-90. **Mohr, O. L.**—Cases of mimic mutations and secondary mutations in the X-chromosome of Drosophila melanogaster. **128,** xxviii, 1-22. **Muller, H. J.**—Variation due to change in the individual gene. **90,** lvi, 32-50.

ARACHNIDA, ETC. Gandara, G.—El piojo blanco del hombre. (Mem. Soc. "Alzate," Mexico, xxxv, 275-301.)

Petrunkevitch, A.—Tertiary spiders and Opilionids of No. America. (Trans. Conn. Ac. Arts & Sci., xxv, 211-79.)

NEUROPTERA. Lestage, J. A.—Etudes sur la biologie des Plecopteres. **134,** x, 231-60. **Longinus Navas, R. P.**—Insecta nova (Mem. Ponti. Accad. Romana, Nuovi Lincei (2), v, 1919, 1-29.)

HEMIPTERA. Knight, H. H.—Nearctic records for species of Miridae known heretofore only from the palaearctic region. **4,** liii, 280-88. **Poisson, R.**—Brachypterisme et apterisme dans le genre Gerris. **69,** clxxv, 947-50.

Dozier, H. L.—A synopsis of the genus Stenocranus, and a new

species of Mysidia. **82,** xxii, 69-83. **Drake, C. J.**—A new species of Plea (Notonectidae.) **82,** xxii, 114-16.

LEPIDOPTERA. Cockerell, T. D. A.—A fossil moth from Florissant, Colorado. **138,** No. 34. **Farm Collection**—Sale of the Farm collection. **21,** xxxiv, 48-51. **Warren, B. C. S.**—The genus Hesperia.—A correction. **21,** xxxiv, 41-2.

Busck, A.—Microlepidoptera from British Columbia. **4,** liii, 276-80.

DIPTERA. Riquelme Inda, R.—Las moscas llamadas "Tse-tse" en el Africa, no existen en la America. (Mem. y Rev., Soc. Cient. "Antonio Alzate," Mexico, xl, 47-55.)

Curran, C. H.—New species of Canadian Syrphidae. **4,** liii, 275-6.

COLEOPTERA. Dozier, H. L.—An annotated list of Mississippi Chrysomelidae. **82,** xxii, 117-24. **Riquelme Inda, J.**—El "Max" del henequen. (Scyphophorus acupunctatus.) (Mem. Soc. "Alzate," Mexico, xxxv, 303-18.)

Buchanan, L. L.—Notes on Apion, with descriptions of two n. sps. (Curculionidae.) **10,** xxiv, 82-4. **Chapin, E. A.**—New North American Hydnocera (Cleridae). **54,** xxxv, 55-8.

HYMENOPTERA. Cockerell, T. D. A.—Bees of the genus Perdita from the western United States. **138,** No. 33.

INSECT TRANSFORMATION, by GEO. H. CARPENTER, D. Sc., Professor of Zoology, Royal College of Science, Dublin; Sec. Royal Irish Academy. Methuen and Co., Ltd., 36 Essex Street, W. C., London. 282 pp., 4 plates and 124 illustrations in text.

Professor Carpenter's researches on various groups of insects are so well known to entomologists in general that a new book from his pen is sure of a cordial welcome from them. This work is, to use the words of his preface, "designed to serve as an introduction to the study of growth and change in the life of insects," and he hopes that it "may be of some service to serious workers in entomology as well as to beginners."

The plan of the book is a good one. The reader is first introduced to a few familiar examples of the changes that accompany growth in the lives of insects, and the morphology of the adult insect is fully explained before any attempt is made to classify the different types of change met with. Then, by the use of the Grasshopper, Dragonfly and Moth as examples, the reader is led to the generalized conceptions to which entomologists have come to apply the comparative terms "ametabolic," "hemimetabolic" and "holometabolic." Following Dr. Sharp's lead, the phenomena of metamorphosis amongst winged insects is then divided into its two main sections, the "open" type of wing-growth (Exopterygota) and the "hidden" type (Endopterygota), and examples

are given illustrating the metamorphosis of each of the Orders of Insects that come under these two headings. This leads, in Chapter V, to the consideration of wingless insects and the effect of parasitism on the form of an insect, and this secondary winglessness is then contrasted with the primitive unaltered winglessness of the true Apterygota, the Spring-tails and Bristle-tails. The ground thus covered enables the author to give in Chapter VI a concise classification of the Insecta, in which twenty-three Orders are recognized. Chapter VII deals with the correlation between the growing insect and its surroundings, and we are here introduced to the secondarily aquatic larvae of certain Diptera (sandfly, mosquito, etc.), the habits of burrowing and sucking the juices of plants, the formation of galls, the parasitism of one insect by another, and finally the care of the helpless young by the adult, as in the case of ants. The last chapter deals with the general problems of insect transformation, and emphasizes the apparent paradox that, whereas, in other groups of animals, low-grade forms are found to undergo more profound changes than high-grade forms, yet in the case of insects the reverse is true, metamorphosis becoming more and more complete as we pass upwards to the more highly evolved forms. The reason for this is very clearly explained, and we can recommend this part (Chapter VIII) as the best in the book, particularly the illuminating discussion as to the probable primitive type of insect larva, the evolution of the two types of wing-growth, and the short but excellent summary of the palaeontological evidence.

Any book dealing with so large a subject can scarcely claim to be original, but the author certainly has as much claim as anyone to be considered an authority on his subject. Thus we note, as we should expect, that he has introduced illustrations and examples from a number of recent researches by modern authors, which greatly enhance the value of the book. While the general conception and detail of the book are alike excellent for the beginner, the more advanced student will note some omissions of considerable importance. For example, in dealing with the problem of wing-growth, no mention is made of the turning over of the wing-buds in Odonata and certain Orthoptera, in which the hindwing sheath comes to overlie that of the forewing. In dealing with the evolution of the pupal state (Chapter II) the author passes in review the various larval forms found in the Hymenoptera, but quite fails to mention the praepupal or subpupal stage, which is the most significant of all facts in connection with this problem, and so misses the clue to the explanation of the reduction of the number of instars, without which a true view of the meaning of the pupal state can scarcely be attained. Again, much has been written in late years on the internal changes accompanying metamorphosis, yet this fascinating and intricate subject is dismissed in ten pages at the end of Chapter IV. There are many students of insects at the present day who would be

extremely grateful for a clear exposition of the stages by which the "imaginal buds" of Weismann as seen in the Dipterous maggot, have been evolved, and for an authoritative account of the definite changes undergone by the various internal organs and tissues of the insect body during the actual metamorphosis. Though we realize that these are difficult subjects and that more researches upon the older Holometabola are still needed, we may be allowed to feel disappointed that so little help in elucidating these problems is offered in the present volume.

The text and figures have been on the whole very carefully prepared, though there are a few errors that need to be corrected. On p. 16, fig. 7, the letters A, C, M are made to point to the wrong veins. On p. 106 we are told that "the ninth segment has a pair of stiff, bristly cerci"; the accepted definition of "cerci" makes this statement inaccurate. On p. 178 we read that, in the Order Orthoptera, "the female's ovipositor is well and typically developed"; but this is certainly not true of the Cockroaches and Mantids, included in the Order. On pp. 178-9 the definitions of the Orders Plecoptera and Isoptera leave much to be desired, while the Embioptera or Web-spinners are entirely omitted! A stereotyped error due to Alvah Peterson and others, is perpetuated on p. 185, where it is stated that "labial palps are absent" in the Diptera; the latest researches go to show undoubtedly that the labellum is formed from these palps. On p. 269 it is stated that the Coleoptera of the Trias include representatives of the Chrysomelidae and Weevils. This is incorrect; the only families which can be shown to have existed with any certainty at that time are the Cupesidae and Hydrophilidae, though there is a strong probability that other elytra belonged to the Carabidae, Tenebrionidae and Cerambycidae, together with a few more obscure archaic families.

In concluding this review we should like to congratulate the author on this his latest work, which is to be strongly recommended to all students who are interested in this fascinating subject.—R. J. TILLYARD.

Doings of Societies.

Entomological Section, The Academy of Natural Sciences of Philadelphia.

Meeting of September 22, 1921. Thirteen persons present. Vice-Director R. C. Williams presided.

GENERAL.—Mr. Rehn gave a brief narrative of the summer field excursion taken by Mr. Hebard and himself in the western States. Mr. Hornig exhibited specimens showing an English method of interesting young people in nature, in this case entomology, and said that he thought such methods would be practical here in America. The exhibit consisted of a box of twelve micro-slides of parts of insecst, selling for about two or three shillings, also a book entitled "Butterflies and Moths at

Home," containing over fifty half-tone illustrations showing the commoner species. This, he said, sold for about sixpence.

COLEOPTERA.—Dr. Skinner exhibited specimens of a coleopterous insect which is reported to be seriously injuring the rose bushes about Philadelphia. It is a Chrysomelid, *Typophorus quadrinotatus* Say, and is apparently new as a rose-foliage pest.

HYMENOPTERA.—Dr. Skinner also exhibited a specimen of a male of *Pelecinus polyturator* Dru., captured by one of our contributors, Mr. A. R. Allen, at Northeast Harbor, Maine, August 10, 1921. He spoke about the scarcity of the males of this insect in the United States and said that Dr. Hagen, while on a visit to Philadelphia, asked to see the male, stating that he came to Philadelphia especially to see one.

ODONATA.—Dr. Calvert spoke briefly on the Costa Rican species of *Palaemnema*, stating that the six species which he had collected in that country differed from each other in the shape of the abdominal appendages of the males, as well as in slight color characters, but that in three species the penis was alike, while in the remaining three the penis differed in the shape of the tips of the terminal filaments from that of the first three. Thus on penis-shape there were two groups within the genus.—E. T. CRESSON, JR., *Recorder.*

Meeting of December 12, 1921. Eight persons present, including Mr. Theodore H. Frison, of Riverton Japanese beetle laboratory. Vice-Director R. C. Williams presided.

GENERAL.—The following report of the editors of the Entomological News was read:

The Entomological News has just completed a trying year. The cost of printing reached its maximum this year, compelling us to meet an increase of about $300 for the yearly edition. In order to balance this additional expense an increase in the subscription price was contemplated, but wishing to be reasonably sure that there would not be a great falling off of subscriptions, a vote was taken in the latter part of 1920 of the subscribers as to their willingness to continue with an increase of 50 cents. This resulted in sufficient votes to warrant the trial. The latest mailing list shows 407 subscribers, which is but slightly (about 15) below that of 1920. Were it not for this increase in price and the loyalty of the majority of our subscribers, our present balance, although small, would have been impossible. Of course the Society has extended its helping hand by purchasing the copies used in the exchanges for the Library, but it has done this for several years past and it is seemingly proper that it should do so.

The following officers and committees were elected to serve for 1922: *Director,* Philip Laurent; *Vice-Director,* R. C. Williams, Jr.; *Secretary,* J. A. G. Rehn; *Recorder,* E. T. Cresson, Jr.; *Treasurer,* E. T. Cresson; *Conservator,* Henry Skinner, M.D.; *Publication Committee,* E. T. Cresson, P. P. Calvert, Ph.D., and E. T. Cresson, Jr.

HYMENOPTERA.—Mr. Frison made a very interesting communication

on the life-history of the Bumblebee, illustrated with excellent lantern slides, showing the various stages in the nesting life, methods of rearing and establishing of colonies. The nesting habits were discussed in detail, how and where colonies are established by the queen in the spring of the year. The successive stages beginning with the honey-pot, then the egg cell, then the emergence of the adult, were shown. The different forms of cell-making by several of the species observed, and the most serious parasites were also shown. The speaker then explained how experimental colonies are introduced in the field and laboratory, and the apparatus used. It was evident that the speaker was well acquainted with his subject, and that it must have taken a number of years of study in order to secure the information and technic which he possesses.—E. T. CRESSON, JR., *Recorder.*

OBITUARY.

Thanks to Dr. T. Tzabò-Patay of the Hungarian National Museum, I have recently received the January-February, 1916, number of *Rovartani Lapok* which includes an obituary notice of our lamented SANDOR MOCSÀRY. For the sake of those interested, to whom the facts are not accessible, I venture to introduce the following free translation of the German summary published in the same place.

A. Mocsàry. 1841-1915.—The highly meritorious Hymenopterologist, A. Mocsàry, Abteilungsdirektor i. P. of the Hungarian National Museum in Budapest, died suddenly Dec. 26, 1915, after a protracted illness. He was the Nestor of the Hungarian entomologists, a generally esteemed scholar, whose death will be deeply mourned by his colleagues. Apropos of his 40 year service jubilee, *Rovartani Lapok*, Vol. 17, 1910, pp. 161-175, published a sketch of his life and this obituary refers back to that sketch. To complete, it remains to be noticed that Mocsàry was born in Nagyvarad, Sept. 27, 1841, where he also pursued his studies. In 1870 he was appointed as assistant in the National Museum, to which institution he belonged for 44 years as an energetic official. The first of June, 1915, he entered on his well-earned retirement; still he could not long enjoy this as his stomach trouble recurred and caused him to take to his sick bed. The burial took place December 28. On this occasion Dr. G. Horvath, representing the National Museum and the Ungarische Akademie der Wissenschaften, and J. Jablonowski, the Ung.

Entomologischen Gesellschaft, took their leave of the deceased in nobly held funeral orations.

So much for the translation. I may add that Mocsàry's bibliography comprises 178 titles, mostly devoted to Hymenoptera, especially Chrysidoidea. His contributions to science cover approximately 2594 pages.—H. L. VIERECK.

Among those who have contributed to entomology, whose deaths have not hitherto been noted in the NEWS, is Dr. ERNEST ROUSSEAU, who died November 13, 1920. Two notices of his life and work have appeared, both by M. J.-A. Lestage, one in the *Bulletin de la Société Entomologique de Belgique* (tome III, pp. 35-41, with a portrait), the later and longer in the *Annales de Biologie Lacustre* (tome X, pp. 261-283). Both are accompanied by the same list of his biological writings.

He was born at Ixelles, Belgium, May 27, 1872, his father professor of physics at the University of Brussels, his mother, born Hannon, a botanist. "Elevé dans un milieu si hautement scientifique," says his biographer, "Rousseau devait fatalement venir a la science; en effet, il lui consacra toute sa vie." While a medical student in Brussels, he joined the Entomological Society there and published on Carabidae and Malacoderms of Belgium. For some years his zoological activities were turned to sponges and to insect histology, then again to the Carabidae, when he contributed to Wytsman's *Genera Insectorum*. In 1906 the Museum of Natural History at Brussels placed him in charge of those limnological studies for which he is best known. In pursuance of these he established a fresh-water biological laboratory at the Lake of Overmeire and a new journal, the *Annales de Biologie Lacustre*, which has reached its tenth volume. Of the 57 papers (some unpublished) listed in his bibliography, 1 deals with Hydrachnids, 3 with insect histology and anatomy, 6 with Odonate larvae, 14 with adult Coleoptera, 2 with larvae of Coleoptera, 2 with Diptera, 1 with aquatic Hymenoptera. At the time of his death he had two works in preparation, one on *La Biologie des eaux douces* for the Encyclopédie Scientifique of Doin et fils, Paris, the other *Les Larves aquatiques des Insectes d'Europe*, in collaboration with J.-A. Lestage and H. Schouteden. The first volume of

the latter has appeared since his death, consisting of 987 pages and 343 figures, and deals with the aquatic larvae of the Hemiptera, Odonata, Ephemerida, Plecoptera, Megaloptera, Planipennia and Trichoptera. According to a note on page 32 of the *Bulletin* quoted, the second volume will treat of the Lepidoptera, Coleoptera, Diptera and technique.

His biographer, writing of him as an intimate friend, declares him to have been a man thoroughly good, generous, enthusiastic over his work, who irresistibly attracted the sympathies of all.—P. P. CALVERT.

The daily newspapers announced the death of Sir PATRICK MANSON, in London, April 8, 1922. He rendered two important services in ascertaining the mode of transmission of human diseases. The first was in 1878, when he discovered the manner of carriage of *Filaria* from man to man by mosquitoes,* thus, as Howard, Dyar and Knab state, becoming "the discoverer of the first recognized transfer of a disease organism by mosquitoes." The second was when he "first clearly formulated the hypothesis [of the rôle of carrier of malaria by mosquitoes]†, and it was largely due to his suggestion that Ross in Indian undertook to solve the problem" (Riley and Johannsen).

He was the son of John Manson, of Fingask, Aberdeen, was born October 3, 1844, was educated as a physician, and contributed to the literature of parasitology and tropical medicine. He was a fellow of the Royal Society, an honorary LL.D. of Aberdeen and of Hongkong, and an honorary Sc.D. of Oxford. In recent years he lived at The Sheiling, Clonbur, County Galway, Ireland.

His son, Dr. P. Thurburn Manson, was one of two who offered to be bitten by malaria-infected mosquitoes from Rome, in testing the malaria-mosquito theory, and who developed characteristic malaria as a result.—P. P. CALVERT.

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*The development of *Filaria sanguinis hominis*. Medical Times and Gazette, London, II, p. 731, 1878. On the development of *Filaria sanguinis hominis* and on the mosquito considered as a nurse. Journ. Linn. Soc. London, Zool., xiv, pp. 304-311, 1878.

†Hypothesis as to the life history of the malarial parasite outside the human body. Lancet, London, 1896, ii, pp. 1715-1716.

Dr. JOSEPH LANE HANCOCK, one of the leading American authorities on Orthoptera, died of heart disease in Chicago, March 12, 1922. Born in that city on April 12, 1864, it is said that he "had attained almost equal distinction as a physician, naturalist, landscape artist and as an author."

In the study of Orthoptera, Dr. Hancock specialized on the Tettiginae (Acrydiinae) or "Grouse Locusts." His work on this group was equal in volume to, if not more extensive than, that of any other authority on the subject. His scientific publications, begun in 1895, continued until 1918, when press of work as a practicing physician forced him to abandon the study.

His largest publications in chronological order, are: *The Tettigidae of North America, The Tettigidae of Ceylon*, a series of *Studies of the Tetriginae in the Oxford University Museum* and *Indian Tetriginae*. His collection of Acrydiinae, one of the largest in the world, has been kept in an exceptionally good state of preservation, and now forms a portion of the Hebard Collection, deposited at the Academy of Natural Sciences of Philadelphia, having been acquired by purchase.

He was also the author of *Nature Sketches in Temperate America* (Chicago, McClurg & Co., 1911), "a popular account of insects birds and plants, treated from some aspects of their evolution and ecological relations," the last chapter being an "interpretation of environment as exemplified in the Orthoptera."

Dr. Hancock was at one time Curator of the Chicago Entomological Society and Editor of its *Occasional Memoirs*. He was a Fellow of the American Association for the Advancement of Science and of the Entomological Society of London.

Always kind and liberal in co-operation with other students of the Orthoptera, it is our regret that we knew Dr. Hancock only through infrequent correspondence.—MORGAN HEBARD.

Correction.

Insert the word "catalogs" after "manuscript," page 118, 4th line from the bottom.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

I will collect material in any order, region Isthmus of Tehuantepec and C. A. Correspondence from persons needing material invited. J. J. White, Ocotlan de Morelos, Oaxaca, Mexico.

Wanted.—Diabrotica longicornis Say. from all parts of its range; also any N. A. species of this genus new to my collection. Liberal exchange. K. F. Chamberlain, Cornwall Bridge, Connecticut.

Wanted.—Elateridae from the Southern and Western States; Adelocera, Melanotus, and Cardiophorus especially desired. Liberal exchange in other Coleoptera, or for cash. Edward D. Quirsfeld, Hillsdale, New Jersey.

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Wanted—Species of Homoptera, Hemiptera and Orthoptera not represented in my collection in exchange for duplicate material of these orders from South Dakota. List of duplicates on application. H. C. Severin, South Dakota State College, Brookings, South Dakota.

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Wanted for Cash or Exchange—Catocala eggs, also brilliant colored butterflies and moths for trays. Mrs. Robert Milde, Lewiston, Minn.

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COLEOPTERA

815.—**Fall** (H. C.).—The North American species of Gyrinus. (Trans., **47**, 269-306, 1 pl., 1922)..... .80

DIPTERA

818.—**Cresson** (E. T., Jr.)—Studies in American Ephydridae III. A revision of the species of Gymnopa and allied genera constituting the sub-family Gymnopinae. (Trans., **47**, 325-343, 1 pl., 1922)..... .45

ORTHOPTERA

817.—**Hebard** (M).—The janeirensis group of the genus Euborellia, with the description of a new species. (Dermaptera). (Trans., **47**, 319-324, 2 pls., 1922).... .20

816.—**Rehn** (J. A. G.).—Studies in Costa Rican Dermaptera and Orthoptera. I. Two new genera and three new species of Dermaptera. (Trans., **47**, 307-313, 1 pl., 1922) .20

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The Entomologist's Monthly Magazine.—A journal devoted to general Entomology, started in 1864, and now edited by G. C. Champion, J. E. Collin, W. W. Fowler, R. W. Lloyd, G. T. Porritt and J. J. Walker.

It contains descriptions of new genera and species in all orders (British and foreign), life histories, reviews of new works, etc. Vol. LVIII (VIII of the 3d Series) was commenced in January, 1922. The subscription for the 12 numbers is 15 shillings per annum, post free, to be sent to R. W. Lloyd, I, 5, Albany, Piccadilly, London, W., England. For terms for advertisements apply to him also.

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